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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,713	05/03/2005	Mark Van Schijndel	NL 021393	7859

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EXAMINER	
VERDERAME, ANNA L	
ART UNIT	**PAPER NUMBER**
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/533,713	VAN SCHIJNDEL ET AL.	
	Examiner	Art Unit	
	Anna L. Verderame	1756	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-7* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-7* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *03 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *12/01/2005*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 7 provides for the use of an optical data storage medium as claimed in claim 1, but, since the claim does not set forth any steps involved in the method/process, it is unclear what method/process applicant is intending to encompass. A claim is indefinite where it merely recites a use without any active, positive steps delimiting how this use is actually practiced.

Claim 7 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process, i.e., results in a claim which is not a proper process claim under 35 U.S.C. 101. See for example *Ex parte Dunki*, 153 USPQ 678 (Bd.App. 1967) and *Clinical Products, Ltd.* v. *Brenner*, 255 F. Supp. 131, 149 USPQ 475 (D.D.C. 1966).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Mizuuchi et al. EP 1 096 484.

Mizuuchi et al. teaches an optical recording medium like that shown in figure 1(0084-0100). The recording layer 4 and 6 are made of a phase change material. The first recording layer can have a thickness in the range of 4-12 nm. For the first reflective layer 7, Al, Au, Ag, or Cu, or an alloy thereof may be used. The first reflective layer 7 has an optical function of increasing the quantity of light absorbed in the first recording layer 4 and a thermal function of diffusing heat generated in the first recording layer 4 rapidly. The thickness of the first reflective layer is at most 20 nm so that a light transmittance of atleast 45% can be obtained in the first recording medium 17. Range of 2 to 20 nm is taught at (0037). The separation layer is provided for distinguishing the focal positions in the first recording medium 17 and the recording medium 18. The separation layer 8 is required to have a thickness equal to or greater than a focal depth determined by a numerical aperture NA of an objective lens and a laser beam wavelength λ.

Examples 1-2 are media according to the first to third embodiments of the present invention(0152). The thickness of the first recording layer 4 is 6 nm(0155). Table 1 shows that the value of K_λ when λ is 400 nm and GeSbTe is in the crystalline state is 1.30(0153)

. The value of t_{RL1}* K_λ is 7.8nm which is less than 8 nm.

Applicant should specify a wavelength range in which the quantity $K_\lambda * t_{RL1}$ is less than 8nm.

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Kitaura et al. 2001/0005350.

In an example, Kitaura et al. teaches an optical recording medium according to figure 1 comprising a substrate, a lower protective layer of ZnS-SiO_2 having a thickness of 110 nm, a Ge-Sb-Te recording layer having a thickness of 6nm, an upper protective layer of ZnS-SiO_2 having a thickness of 40 nm and a reflective layer of Ag-Pd-Cu having a thickness of 10 nm. The same substrate as above was used as a second substrate. As a second information layer a reflective layer, an upper protective layer, a recording layer, and a lower protective layer were formed(0065-0066). The refractive index and the extinction coefficient k of the material of each layer are the same as shown in table 1(0072). Table 1 teaches that the extinction coefficient k for the recording layer in the amorphous state is 1.5 for a wavelength of 660 nm and 2.0 for a wavelength of 405 nm. The thickness of the separating layer 3 is required to be more that the depth of focus(0043). The recording layer 7 preferably has a thickness in the range of 3 nm to 10 nm for the reasons stated at (0040). The reflective layer may be formed of single element metal materials including Al, Au, Ag, and **Cu**(0041). In the example the reflective layer of the first recording layer is 10 nm. Use of interface layers 20 on either side of the recording layer in order to prevent mutual diffusion of atoms between the recording layer and the

protective layers is taught at (0046). See also paragraphs 0033-0047 which describe the medium shown in figure 1.

Based on the example at (0065-0066) and the disclosure of Kitaura et al., one would immediately envision an embodiment where the reflective layer is formed of Cu having a thickness of 10 nm, and in which the recording layer of the first recording stack 2 is formed to a thickness of 3nm. In this embodiment the value of $K_\lambda * t_{RL1}$ for a wavelength of 660 nm is 4.5nm(1.5* 3nm), and the value of $K_\lambda t_{RL1}$ for a wavelength of 405 nm is 6nm (2* 3nm). Both of these values are less than 8nm.

The extinction coefficient is independent of the path length or in this case the thickness of the recording layer.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shimizu et al. WO 02/50190(US 2003/0187272 used as a translation) in view of Mizuuchi et al. EP 1 096 484 and Kojima et al. 2002/0024913.

In example 41 Shimizu et al. teaches a recording layer prepared by dissolving compound 1 in 2,2,3,3-tetrafluoropropanol and coating it to a thickness of 90 nm onto a grooved substrate. A reflective layer and a protective substrate

are subsequently formed on the dye recording layer. The recording layer was recorded using a laser having a wavelength of 658 nm[(WO-48/15-49/12)/(US/0204-0206)]. Table 6 shows that the extinction coefficient for compound 1 is 0.078 for a wavelength of 650 nm and is 0.038 for a wavelength of 660nm[(WO-page 47)/(US-0194)]. For this embodiment, the value of $K_\lambda t_{RL1}$ is 7.02nm for a wavelength of 650 nm and is 3.42nm for a wavelength of 660 nm. Both of these values are less than 8 nm. Dyes according to the present invention absorb at a wavelength of between 600-700nm preferably 630-690nm[(WO-17/5-10)/(US-0055)]. The extinction coefficients of the dyes of the present invention are within the range of 0.02-0.3 for the wavelength of light used for recording or reproduction[(WO-17/10-16)/(0056)]. The thickness of the recording layer is preferably 10-100nm and more preferably 20-200nm[(WO-20/14-15)/(US-0076)]. Undercoat layers and protective layers are also discussed[(WO-27-28)/(US/0102-0113)].

Shimizu does not disclose a multi-stack optical data storage medium as disclosed in claims 1-6 of the instant application.

The teachings of Mizuuchi et al. can be found in paragraph 4 above. Mizuuchi et al teaches a dual-layered optical recording medium as shown in figure 2 wherein the metal reflective layer of the first recording stack 17 may be formed of Cu to a thickness of between 2-20 nm and where the value of $K_\lambda * t_{RL1}$ is less than 8 nm. The transmittance for the first recording stack is 45% or more.

However, the reference does not teach the formation of a recording layer comprising an organic material wherein the thickness of the recording layer is

between 70-125 nm and the value of $K_\lambda * t_{RL1}$ is less than 8 nm. The reference also does not teach the use of auxiliary layers on either side of the reflective layer of the recording stack nearest the light incident plane.

Kojima et al. teaches an optical recording medium like that shown in figure 3 comprising a dielectric layer 16, an interface layer 17, a recording layer 18, an interface layer 19, a dielectric layer 20, and interface layer 21, a reflective layer 22, an interface layer 23, and a dielectric layer 24 in the first recording stack 13. The interface layers 21 and 23 prevent a substance from moving between the dielectric layers and the reflective layer 22. As materials for the interface layers a nitride such as Si-N or a nitride oxide including Si-O-N may be used(0060-0061). The thickness for the interface layers is in the range of 1 to 10 nm and more preferably in the range of 3 to 7 nm(0061). The interface layers may be omitted(0060). In this case dielectric layers 20 and 24 would surround the reflective layer 22 of the first recording stack 13. Materials for the dielectric layers include SiO_2, Si-N, and Si-O-N(0058). The structure of the medium of Kojima et al. is substantially similar to that taught by Mizuuchi et al. The thickness of the first recording layer has a thickness of 9 nm or less.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the optical recording medium of Shimizu et al. comprising an organic material recording layer in which the value of $K_\lambda * t$(thickness of recording layer) is less than 8 nm by forming a dual layered medium having the structure taught by Mizuuchi et al. which also comprises a recording layer in which the value of $K_\lambda * t_{RL1}$ is less than 8 nm with the reasonable expectation of

forming a medium having double the recording capacity. The resulting optical recording medium is a result of the mere use of common sense by one skilled in the art to select and combine known elements to form an optical recording medium in which each of the elements serve no new function and which results in a predictable result. The predictable result in this example is the doubling of the recording capacity of the medium. Further, it would have been obvious to modify the resulting medium by forming interface layers of Si-N or Si-O-N having a thickness of between 1 to 10 nm on either side of the Cu reflective layer nearest the light incidence plane based on the teachings of Kojima et al. at (0060-0061) and with the reasonable expectation of preventing a substance from moving between the dielectric layers and the reflective layer.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

-5,976,658- dye recording layer comprising a cyanine dye. Laser wavelength 620-690 nm. Extinction coefficient in the range of 0.01-0.45(abstract). See figures 1-5. Teachings equivalent to those of Shimizu et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anna L. Verderame whose telephone number is (571)272-6420. The examiner can normally be reached on M-F 8A-4:30P.

9. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Huff can be reached on (571)272-1385. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ALV

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